

Producer Perspectives on Using Fence Line Hay Feeders

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Introduction

Fence line hay feeders provide an alternative system of hay feeding that, unlike other options, allows cattle and the producer to be on opposite sides of the fence during feeding. The hay feeder is built into the fence and eliminates the need for the producer to enter the field to feed the cattle. The ability to feed hay in this system produces many possible benefits for both cattle and producer. Feeding times are shortened, safety for the cattle and producer is increased, less hay is wasted, and pasture damage is confined to smaller areas. With a well-constructed feed pad, cattle are able to feed in an area that is drier and mud can be managed. An additional benefit is seen in animal handling when feeders are constructed near animal handling facilities (Figure 1).

In 2019 and 2020 the University of Tennessee Extension established on-farm fence line hay feeder demonstrations at 14 sites in six counties in the southern Middle Tennessee area (Giles, Moore, Marshall, Maury, Lincoln and Lawrence). University of Tennessee Extension agents in each of those counties worked with producers during feeder construction in regard to location, feed pad design and feed panels. The cost of construction materials ranged from \$1,500 to \$4,500 and depended on the design, size and feed pad. Producers were surveyed and interviewed at the end of the winter hay feeding period to identify benefits and potential improvements for their hay feeding system.

Producer Background

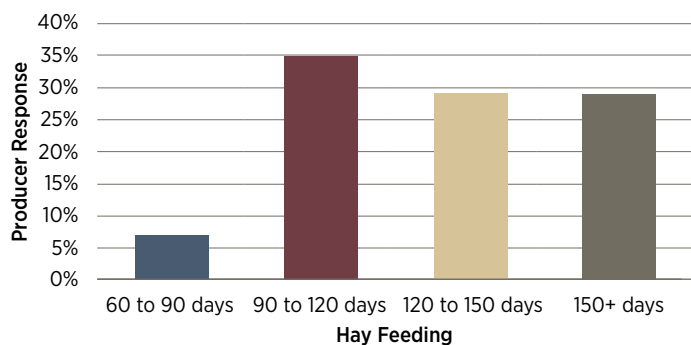
Producers that were part of this demonstration are considered typical beef cattle producers in Middle Tennessee. Their herds ranged from 30 to over 500 head. Greater than half of these herds consisted of less than 200 head. Most (71 percent) were cow/calf herds, and the rest



Figure 1. Strategically positioning fence line hay feeders close to hay storage and other facilities, such as working facilities, reduces the time spent feeding hay and may help in catching and handling cattle. (Photo credit: Matt Webb).

were stocker operations. Approximately 86 percent of the farmers reported that they produced all or most of their own hay. Most fed hay for more than 120 days (Graph 1) with the feeding period concentrated during the winter months. All producers used round hay bales. In addition to hay, 57 percent grazed cattle on either stockpiled pasture, winter annuals or cover crops. Silage or haylage was also used by 29 percent of the producers. Grain or by-product commodity feeds were more widely used by the stocker operators. Producers were evenly split between working full or part time on the farm.

Producers were encouraged to use metal skirting boards or skirted feed panels (Figure 2) to reduce hay waste, and 12 of the 14 sites chose that option. The 24 inch tall metal skirt along the bottom of the feed panel reduces the amount of hay that falls out of the feeder and keeps mud and manure from being kicked into the middle of the feeder. In these demonstrations, the length of these feeders ranged from



Graph 1. Length (days) of hay feeding period.



Figure 2. Most producers in this demonstration chose this type of feeder using skirted feed panels. Producers varied in their choice of feed pad but this example was gravel/chert on top of geotextile. Producers also varied the size of the feeder based on their herd needs. This would be considered a two-bale feeder with two 12 foot long side panels, one 8 foot end panel and an 8 foot gate. (Photo credit: Matt Webb).

12 feet to 36 feet with a width of 8 feet. The feed panel openings were 2 feet long to allow cattle access to hay. Of the 12 producers that used the feed panel design, one had the feeder under a roof. Two producers did not use the skirted feeder design. One used two pieces from a three-piece skirted hay ring. The width for the hay ring feeder was 6.5 feet. Using two of these hay rings built into the fence essentially gives the producer three feeding areas (Figure 3). One producer used a manufactured hay feeder with a roof (Figure 4).

Producers also had their choice of feed pad construction. The feed pad construction is crucial for allowing cattle the opportunity to feed in a dry environment and can help reduce hay waste. Materials used for feed pad construction were either concrete, gravel or chert. Nine of the producers used gravel and chert or a mixture of both. Two of these producers used geotextile fabric as a base prior to pouring on gravel or chert. Five producers elected to use concrete as a feed pad. One of these producers used an existing concrete pad. Of those who used concrete

pads, three producers also raised the pad inside the feeder 6 inches higher than the surrounding pad. This was a recommendation to further reduce hay waste by allowing moisture to drain away from the hay.

Benefits of Fence Line Hay Feeders

Producers overwhelmingly reported that they enjoyed not having to enter the feeding area to feed hay to cattle. The normal practice of using hay rings scattered throughout a field results in widespread pasture damage both from cattle and tractor traffic. Many of the producers commented that because mud and pasture damage was restricted to the area where the fence line hay feeders were located, fields were less damaged, and there was less or no tractor ruts to repair after hay feeding was over. Though cattle certainly do a lot of damage to pasture and soils during winter hay feeding, a lot of compaction and soil loss occurs due to tractor traffic.



Figure 3. This producer used two pieces from a 3-piece skirted hay ring. This feeder is either chained or bolted to the posts. Feeders placed close to hay storage reduces the amount of time required for feeding. (Photo credit: Matt Webb).



Figure 4. This manufactured hay feeder with a roof accommodated two hay bales and offered some protection from rain. (Photo credit: Matt Webb).

The use of a feed pad greatly reduced the amount of mud in the feeding area as compared to traditional hay ring feeding systems. Since these feeders are stationary, it is essential that a well-constructed feed pad is built to help reduce mud and manure buildup around the feeder and to aid in any clean up that may be required. A limitation for beef cattle maintaining body condition during the winter is the amount of mud that is built up around hay feeding areas. Research has shown that there are reductions of feed intake and animal performance as mud depth increases (Table 1). A producer must be aware that as mud depth increases, cattle expend more energy traveling in mud and will need more feed to compensate. If mud is too deep, cattle often reduce the number of trips to feed bunks or hay feeders. Because cattle had an opportunity to stand on a solid surface out of the mud when feeding out of one of these feeders, producers commented that cattle appeared cleaner and body condition and animal gains were good. One producer reported comments from neighbors who recognized less mud on the bodies of his cattle and fields that appeared less “beaten up” since he started using a fence line hay feeder.

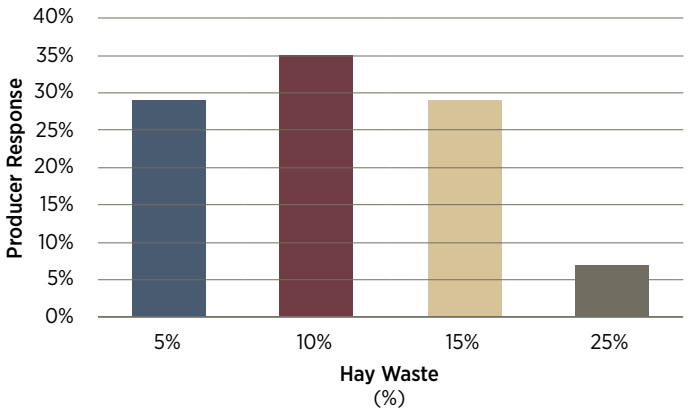
With reduced trips into the field to feed hay, there is less wear and tear on equipment. All the producers built their feeders near a good road or close to hay storage. A producer commented that he was impressed by the reduction of tractor hours that he had accumulated since using a fence line hay feeder. He commented *“I only have to fill the feeder once or maybe twice each week. That means the tractor is only turned on at the most twice each week. The feeder is located next to the hay barn, so it is not far to travel, and I travel on gravel the whole time. Think about how many tractor hours are saved and the kind of tractor hours needed opposed to difficult tractor hours, like those spent in the field filling up hay rings when mud can get quite deep.”* This producer had a feeder that was 24 feet long and accommodated four to five round bales of hay. In many of these situations, producers may not need a large tractor or a tractor with four-wheel drive because they are driving on a good surface and not in the mud.

Table 1. Effects of Mud Depth on Cattle Production*

4 - 8	+12 to 13	-8 to -15	-14
12 - 24	+20 to 25	-30	-25

*Higgins and Wightman, University of Kentucky Extension Publication ID-202.

Hay wastage was considerably reduced with the fence line feeder system compared to using traditional hay rings or unrolling hay directly in the field. While wastage was not eliminated it was reduced to acceptable levels by most of the producers. When surveyed, the producers responded that hay waste when using the fence line hay feeder ranged from 5-25 percent with the average being 11 percent (Graph 2). When asked how this compared with their former method of feeding hay, most producers (71 percent) responded that hay waste was less, and this reduction ranged from 5-50 percent less than the method they had been using. One producer commented that the fence line hay feeder was not as good as a cone feeder but better than a traditional hay ring. Another producer observed that hay waste might not be different if hay quality was not at least average. If using hay containing overly mature forage, hay waste could be higher. Lower quality hay results in reduced animal intake which can result in lower animal gains and milk production.



Graph 2. Estimated hay waste using fence line hay feeders from 14 demonstrators in six counties. Overall, average hay waste was estimated to be 11 percent.

Another factor in hay waste was the width of the feeder and the size of the round roll that was used. Most of the feeders used the feed panels and averaged 8 feet wide though some were narrower and others wider. If a round roll larger than 4 feet by 5 feet or 5 feet by 5 feet was used, the edge of the roll either touched or was close to touching the outside feed panels. As such, cattle could not insert their heads into the feeder. Cattle would grab a bite along the outside of the feeder and whatever hay fell from their mouths was wasted on the ground. Hay waste could be lower if cattle had room to leave their heads in the feeder. Any dropped hay remained in the feeder and could be consumed later. One producer made this observation about these feeders: *“They eat similar to a feed alley. Once the head is inserted it remains until they leave the feeder.”*

Winter hay feeding can be difficult as the weather is often cold and wet. With a lot of producers holding full time jobs, winter hay feeding is often completed during weekday evenings or weekends. An aspect of using fence line hay feeders that the producers enjoyed was quicker feeding times. Traditional hay feeding systems using hay rings in the field may require multiple trips into the field to reload hay rings. As such, this requires many trips on and off the tractor to open and close gates, move cattle or cut baling twine from hay bales. Depending on the design, fence line hay feeders may only have one gate and can be left open until the feeder is finished loading. When asked how long it took to load one of these feeders, the range was one to 30 minutes depending on the feeder and the location of hay storage. The average was between 10 and 12 minutes. When asked how this compared to the former method of feeding, one producer commented, *“It is much more efficient. I like not having to open and close gates each time I drive through.”* Another producer timed himself feeding one group of cattle using traditional hay rings in the field and compared it to feeding in the fence line hay feeder that was located next to his hay barn. *“It took me 8 to 10 minutes to put out one roll of hay in each of my hay rings. My fence line feeder holds five rolls of hay and I could fill it up in about 12 and a half minutes. That group of cows only has to be fed maybe once each week.”* For the most part, these producers did locate these feeders close to hay storage and this kept feeding times low. When asked about the proximity of these feeders to hay storage, 79 percent of the producers had these feeders positioned within 800 feet of hay storage.

An overlooked aspect of winter feeding is the issue of safety both for the producer and for the cattle. Trying to open gates and feed cattle can be a difficult task if the cattle are hungry. There is the possibility of cattle getting out and possibly injuring other cattle or people. Also, trying to drive a tractor in muddy conditions risks getting stuck or running over cattle. As mentioned before, many part-time producers feed late in the evenings or on the weekends and lack of light makes it more precarious for driving tractors or walking out to feed. Three part-time producers specifically mentioned during interviews that their fathers helped with the feeding. They felt like it was an important consideration for using these feeders for aging or inexperienced family members that were helping on the farm. One of the producers mentioned that the field where the feeder was located was used as the bull lot for much of the year. He mentioned it was beneficial to not enter the field when feeding the bulls.



Figure 5. When using concrete feed pads, it is helpful for cattle traffic if the concrete is grooved to prevent slipping. Also notice the raised pad inside the hay feeder. At a height of 6 inches, this pad allows moisture to move away from the feeder but also reduces any mud or manure from seeping under the feed panels. (Photo credit: Matt Webb).

Improvements

There were a few items about fence line hay feeders that the producers did not like or felt could be improved. Just like all facilities on a farm, fence line hay feeders do require maintenance and cleaning to continue to be useful. Feed pads made from gravel and chert need to be top-dressed as some of the material is removed with the waste. Likewise, concrete pads are only useful to the edge of the pad. The edges of those pads will also need to be maintained. Concrete pads need to be grooved to reduce slipping (Figure 5). Feed pads should have at least 2 percent slope off the backside and located in well-drained areas. For the feed pad, it is recommended that at least 10 feet of feed pad space is available around the feeder. This allows cattle to have the room to walk behind each other around the feeder. Ensuring adequate space would also help keep cattle from excessively bumping and pushing into each other during feeding.

A couple of producers wished they had made the feed pad and the area around the feeder larger. The size of the feed pad and the configuration is important for cattle movement and allows room for equipment during cleaning. It is important that gates are located strategically around the feed pad to allow easy access for equipment. These feed pads do require cleaning, but this is not outside normal practice. Many producers using traditional hay rings clean, scrape and pile up the hay waste and manure to be land applied later. Placing waterers at least 150 feet away from hay feeders will reduce the amount of manure accumulated on feed pads. Placing waterers at least this far away forces cattle not to linger at the feeders and they are more likely to defecate out in the field. In this demonstration, 64 percent of the producers had waterers located at least 150 feet away from the feeders.

Those who used a feeder design that was narrower than 8 feet wide wished that it were wider. Building it wider would allow equipment to push rejected hay out of the feeder. However, building a feeder that is too wide restricts cattle access to the hay. When using the feed panel hay feeder designs, a feeder width of 8 feet 6 inches works well as a compromise for cattle access and room for equipment. At this width, when cattle have consumed most of the hay, there will be an 18- to 24-inch swath of hay in the feeder that can be easily pushed to the front of the feeder as the next bale of hay is loaded. As mentioned before, feeding average or better quality hay results in less hay waste and would reduce the amount of cleanup in the feeder.

It is important that the fence line hay feeder match the size and feeding needs of the cow herd that will be using it. Feed panels and hay rings have 2 foot openings to allow cattle access to hay. When using either feed panels or sections of hay rings, fence line hay feeders can be scalable with the limitation being the size of feed pad and ability of the tractor to load the feeders. As an example, one producer had a feeder that was 24 feet long and the cow herd contained about 30 cows. He was able to fit five bales of hay into the feeder and only had to fill the feeder once each week resulting in significant savings in time, labor, fuel and equipment wear and tear. Another producer commented that his feeder was too big for the group of cows that utilized it. In this instance, the producer plans to make the feeder half the size and put the other half in another field. This would allow him to feed two different groups or maybe rotate the hay feeding areas during the winter.

The quality, placement and mounting of the feed panels or pieces of hay ring is another important aspect of these feeders. Heavy duty feed panels or hay rings with thicker gauge metal tend to last longer and are less likely to bow or bend due to cattle pressure. Ensuring adequate space around the feeder and not allowing the feeder to get empty will reduce cattle pressure, but one producer did comment that it may be necessary to add a post in the middle of the panel to help absorb some of the pressure. The downfall to adding posts is the potential to reduce access to hay. A good mounting bracket is essential for the feed panels. Some producers simply chained them to posts because when it came time to clean the feeding area, it would be easy to move the feed panels from the site. It was challenging for these feed panels to stay taut. Hinged and pin brackets supported by a post were more rigid (Figure 6). Skirted feed panels work well for reducing hay waste but make sure that the skirts are attached with good welds. In a couple instances, producers noticed welds coming loose at the skirts.



Figure 6. Different brackets used to install feed panels. The hinged and pin brackets when supported by a post were more rigid than attaching with a chain. (Photo credit: Matt Webb).

Conclusions

Producer perspectives on using fence line hay feeders for winter hay feeding were overall very positive. If correctly constructed and placed in appropriate locations, these feeders resulted in time savings and increased the safety of both the producer and cattle. For most producers, hay waste was reduced compared to their traditional hay feeding methods. Wear and tear on equipment was reduced and damage to pastures and fields was reduced to smaller, more manageable areas. The effect of mud on cattle performance was also reduced.

To fully leverage these benefits, fence line hay feeders should be placed in a location that is well-drained and near hay storage, road access and/or other facilities. Feed pads construction should allow moisture to drain, provide adequate cattle movement and allow access for equipment for cleaning and maintenance. Feed panels or hay rings should be heavy duty to handle cattle pressure. Feeders need to be skirted to reduce hay waste.

It should be noted that the costs to building fence line feeders can be partly covered by the Tennessee Agricultural Enhancement Program (<https://www.tn.gov/agriculture/farms/taep.html>). Other funding programs may be available through local Natural Resources and Conservation Service (NRCS) offices.

For more information on fence line hay feeder contact your local UT Extension office or refer to the additional resources (listed below).

Additional Resources

Eden Shale Farm www.edenshalefarm.com

Engstrom, D.F. 1996. Alberta Feedlot Management Guide. Alberta Agriculture, Food and Rural Development.

Griffith, A., C. Boyer, C. Clark, B. English and D. Lambert. Seasonal Hay Feeding for Cattle Production in Tennessee. University of Tennessee Extension Publication W 839 <https://extension.tennessee.edu/publications/Documents/W839.pdf>

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Higgins, S. and S. Wightman. Feedlot Design and Environmental Management for Backgrounding and Stocker Operations. University of Kentucky Extension Publication ID-202 <https://www.uky.edu/bae/sites/www.uky.edu/bae/files/id202.pdf>

Tennessee Agricultural Enhancement Program. Tennessee Department of Agriculture. <https://www.tn.gov/agriculture/farms/taep.html> <https://www.tn.gov/content/tn/agriculture/farms/taep/producer/livestock-solutions.html>

UTIA. (2019, June 3). Fence Line Feeder [Video]. YouTube. <https://www.youtube.com/watch?v=KNbn2VBe1GE&t=87s>

Acknowledgements

Eden Shale Farm www.edenshalefarm.com

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